

WHAT IS CLAIMED IS:

1. An apparatus, comprising:

5 a conductive section having a recess which includes a balun portion and a slot portion, said slot portion communicating at one end with said balun portion, and said slot portion having edges on opposite sides thereof which each follow a predetermined curve other than a first-order exponential curve; and

10 an elongate conductive element which extends generally transversely with respect to said slot portion in the region of said one end thereof, and which can carry an electrical signal.

15 2. An apparatus according to Claim 1, wherein said predetermined curve for each said edge is configured to facilitate minimization of return loss for electromagnetic signals induced within said slot portion through said elongate conductive element.

20 3. An apparatus according to Claim 1, wherein said predetermined curve for each said edge is configured as a function of characteristics of said balun portion and said slot portion to facilitate minimization of return loss for electromagnetic signals induced within said slot
25 portion by said conductive element.

4. An apparatus according to Claim 1,
including further structure disposed adjacent an end
of said slot portion remote from said one end thereof;
and

5 wherein said predetermined curve is configured as a
function of characteristics of said balun portion, said
slot portion, and said further structure to facilitate
minimization of return loss for electromagnetic signals
induced within said slot portion by said conductive
10 element.

5. An apparatus according to Claim 1, wherein said
predetermined curve includes first and second exponential
characteristics involving respective different
15 exponential powers.

6. An apparatus according to Claim 1, wherein said
predetermined curve includes a plurality of exponential
characteristics involving respective different
20 exponential powers.

7. An apparatus according to Claim 1,
including a dielectric layer;

wherein said conductive section includes two
electrically conductive layers disposed on opposite sides
5 of said dielectric layer, said conductive layers having
respective recesses therein which are aligned with each
other and which each include a balun hole that is part of
said balun portion and a slot that is part of said slot
portion; and

10 wherein said conductive section includes a plurality
of vias which each extend between said conductive layers
through said dielectric layer, said vias being disposed
near each edge of each said slot at spaced locations
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5 modeling said slot portion as a plurality of
segments of electrically conductive material which
collectively have a shape that approximates a shape of
said slot portion; and

evaluating a characteristic of said slot portion by
10 separately evaluating said characteristic for each of
said segments and then combining the evaluations for said
segments.

9. A method of evaluating an operational characteristic of an apparatus which includes a conductive section having therein a recess with a balun portion and with a slot portion communicating at one end with said balun portion, and which includes an elongate conductive element extending generally transversely to said slot portion in the region of said one end thereof, said method comprising the steps of:

modeling said slot portion as a transmission line having a plurality of electrically conductive segments which collectively have a shape that approximates a shape of said slot portion; and

evaluating said operational characteristic for said slot portion by separately evaluating a selected characteristic for each of said segments and then combining the results of the separate evaluations for said segments.

10. A method according to Claim 9, including the steps of:

selectively varying the sizes of said segments to obtain a plurality of different segment configurations;

carrying out said evaluating step separately for each of said segment configurations;

selecting one of said segment configurations which optimizes said operational characteristic; and

configuring said slot portion to have a shape corresponding to the collective shape of said segments of said selected segment configuration.

11. A method according to Claim 10, including the steps of:

selecting as said selected characteristic an impedance characteristic; and

5 selecting as said operational characteristic a return loss characteristic for electromagnetic signals induced within said slot portion through said elongate conductive element.

10 12. A method according to Claim 10, including the step of configuring said segments to be adjacent and parallel strips which extend in a transverse direction with respect to a length direction of said slot portion, and which each have a dimension in said transverse
15 direction which corresponds to a width of said slot portion at a corresponding location along said slot portion.

13. A method according to Claim 12,
20 wherein said segments are approximately rectangular, each have a length dimension of a uniform size in a direction parallel to the length direction of said slot portion, and each have a respective width dimension in said transverse direction; and

25 wherein said step of selectively varying sizes includes the step of selectively varying said length dimension and said width dimensions.

14. A method according to Claim 9, including the steps of:

configuring said balun portion to optimize operation thereof; and

5 thereafter carrying out said steps of modeling and evaluating, said evaluating step including the step of determining said selected characteristic for said balun portion and then taking said selected characteristic for said balun portion into account when evaluating said
10 selected characteristic for each of said segments.

15. A method according to Claim 9, including the steps of:

providing further structure adjacent an end of said slot portion remote from said one end thereof;

15 configuring said balun portion to optimize operation thereof;

20 configuring further structure located adjacent an end of said slot portion remote from said one end thereof to optimize operation thereof; and

25 thereafter carrying out said steps of modeling and evaluating, said evaluating step including the steps of determining said selected characteristic for said balun portion and for said further structure, and then taking said selected characteristics for said balun portion and said further structure into account when evaluating said selected characteristic for each of said segments.

16. An apparatus, comprising:

a conductive section having a recess which includes
a balun portion and a slot portion, said slot portion
communicating at one end with said balun portion, and
5 having a width which is narrowest in a first section of
said slot portion located near said one end thereof, said
slot portion having second and third sections which are
disposed on opposite sides of said first section and
which each have a width larger than the width of said
10 first section; and

an elongate conductive element which extends
generally transversely with respect to said slot portion
in the region of said one end thereof.

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17. A method comprising the steps of:

creating in a conductive section a recess which
includes a balun portion and a slot portion, said slot
portion communicating at one end with said balun portion,
5 and having a width which is narrowest in a first section
of said slot portion located near said one end thereof,
said slot portion having second and third sections which
are disposed on opposite sides of said first section and
which each have a width larger than the width of said
10 first section; and

fabricating an elongate conductive element which
extends generally transversely with respect to said slot
portion in the region of said one end thereof.

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